

[c1]

1. A method of preventing cathode break in an active matrix organic light emitting diode device, comprising the steps of:

providing a substrate, wherein the substrate has an array of thin film transistors and each thin film transistor further includes a gate electrode, a channel layer, a source terminal and a drain terminal;

forming a passivation layer over the substrate covering the thin film transistors;

planarizing the passivation layer;

forming an opening in the passivation layer that exposes the drain terminal; forming an anode layer over the passivation layer and the interior of a portion the opening;

forming a light emitting layer over the substrate covering the anode layer; and forming a cathode layer over the light emitting layer.

- [c2] 2. The method of claim 1, wherein material constituting the passivation layer includes dielectric resin.
- [c3] 3. The method of claim 1, wherein material constituting the anode layer includes indium-tin-oxide.
- [c4] 4. The method of claim 1, wherein material constituting the light emitting layer includes an organic compound capable of emitting light.
- 5. A method of preventing cathode break in an active matrix organic light emitting diode device, comprising the steps of:

  providing a substrate, wherein the substrate has an array of thin film transistors and each thin film transistor further includes a gate electrode, a channel layer, a source terminal and a drain terminal, and the anode layer and the source terminal are electrically connected; forming a patterned passivation layer over the substrate covering the thin film transistors but exposing a portion of the anode layer; forming a patterned photosensitive layer over the substrate, covering the passivation layer and smoothing out the upper surface of the passivation layer; forming a light emitting layer over the photosensitive layer and the anode layer;

and

forming a cathode layer over the light emitting layer.

- [c6] 6. The method of claim 5, wherein material constituting the passivation layer includes silicon nitride.
- [c7] 7. The method of claim 5, wherein the same photomask is used for patterning the photosensitive layer and the passivation layer.
- [c8] 8. The method of claim 5, wherein material constituting the anode layer includes indium-tin-oxide.
- [c9] 9. The method of claim 5, wherein material constituting the light emitting layer includes an organic compound capable of emitting light.
- [c10] 10. A method of preventing cathode break in an active matrix organic light emitting diode device through a process of rounding the corners of the source/drain terminal of a thin film transistor, the method comprising the steps of:

forming a conductive layer over the substrate; forming a patterned photoresist layer over the conductive layer; conducting a dry etching operation using the photoresist layer as an etching mask to form the source/drain pattern of the thin film transistor, wherein the source/drain pattern has a sloping profile at each end; and removing the photoresist layer.

- [C11] 11. The method of claim 10, wherein the gaseous reactant used in the dry etching operation is a gaseous mixture of SF 6 and O 2 and that the SF 6 O 2 ratio is between 0.5~1.0.
- [c12] 12. The method of claim 10 wherein the gaseous reactant used in the dry etching operation is a gaseous mixture of C  $\frac{1}{2}$  and BC  $\frac{1}{3}$  and the C  $\frac{1}{2}$   $\frac{1}{3}$  ratio is between 0.4~0.8.
- [c13] 13. The method of claim 10, wherein the conductive layer is a titanium/aluminum/titanium composite layer.
- [c14] 14. The method of claim 10, wherein the conductive layer is made of

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[c15] 15. A method of preventing cathode break in an active matrix organic light emitting diode device through a process of rounding the corners of the source/drain terminal of a thin film transistor, the method comprising the steps of:

forming a conductive layer over the substrate; and conducting an etching operation to form the source/drain pattern of the thin film transistor, wherein the source/drain pattern has a sloping profile at each end.

[c16] 16. The method of claim 15, wherein the step of forming the source/drain pattern includes the sub-steps of:
forming a patterned first photoresist layer over the conductive layer;
conducting a first etching operation using the first photoresist layer as an etching mask to remove a definite thickness of the conductive layer;
removing a definite thickness from the first photoresist layer to form a second photoresist layer; and
conducting a second etching operation using the second photoresist layer as an etching mask to form the source/drain pattern.

[c17] 17. The method of claim 16, wherein the step of removing a definite thickness of the first photoresist layer includes conducting an ashing operation using oxygen plasma.

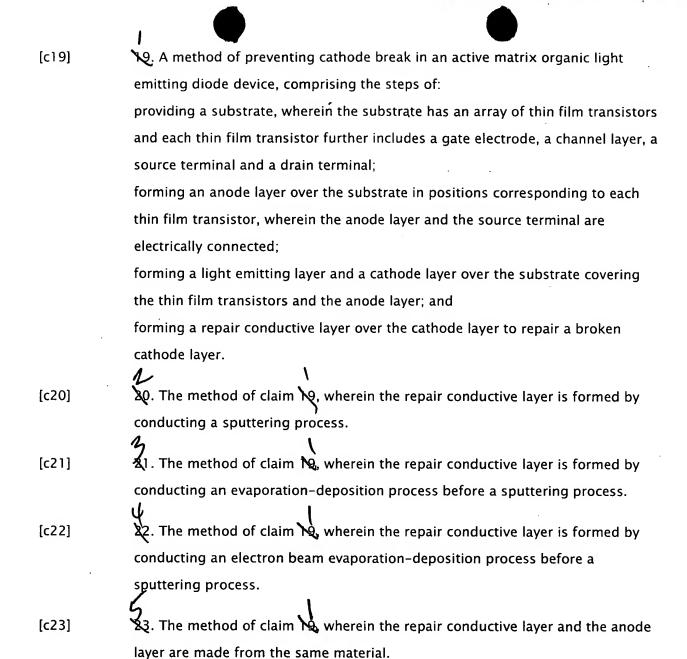
[c18] 18. A method of preventing cathode break in an active matrix organic light emitting diode device through a process of rounding the corners of the source/drain terminal of a thin film transistor, the method comprising the steps of:

forming a conductive layer over the substrate; and conducting an etching operation to form the source/drain pattern of the thin film transistor, wherein the etchant for the etching operation is HNO 3 /H 3 PO

 $_4$  /CH  $_3$  COO, and the weight percentage of HNO  $_3$  in the etchant is between

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0.1~0.2.



Figures